Space Weather Forecast

Issued on Wednesday, 21 June 2023 at 13:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor/Moderate R1/R2 Radio Blackouts Likely throughout. Slight chance of Minor Geomagnetic Storm G1 Days 2 & 3.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been high over the past 24 hours, with an impulsive X-class flare observed at 20/1709UTC. However, recently activity has been quiet. The number of sunspot regions has now reached double figures. The largest and most complex region is now situated in the southwest but remains largely inactive.
There are numerous 'filaments' (arcs of plasma) on the Sun at present although there is no evidence of any resulting CME in satellite imagery.
At present then, there are no new confirmed Earth-directed CMEs.

Solar Wind / Geomagnetic Activity: The solar wind showed probable ongoing connection to a 'coronal hole' fast wind being relatively steady and confined to slightly elevated levels, between 400-450 km/s. The number of particles in the solar wind was within its typical background range throughout, while its magnetic field was also at background. The north-south component was also weak. The net effect of the above solar wind measures was for mostly Quiet geomagnetic activity with one Unsettled interval before midnight.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Moderate, with isolated or occasional M-class flares and a slight chance of X-class flares.

Solar Wind / Geomagnetic Activity: The geomagnetic forecast carries lower-than-average confidence. While mostly Quiet to Unsettled conditions are expected overall, there is a chance of an Active or even a slight chance of a G1/Minor Storm interval on Days 2 & 3 (22nd & 23rd), under the combined influence of the ongoing fast wind and also perhaps a glancing blow from some minor peripheral CMEs.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, with a daily slight chance of S1 or greater.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	10	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	55	51
Very Active	R3 to R5 X	Yes	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	15	20	20
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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